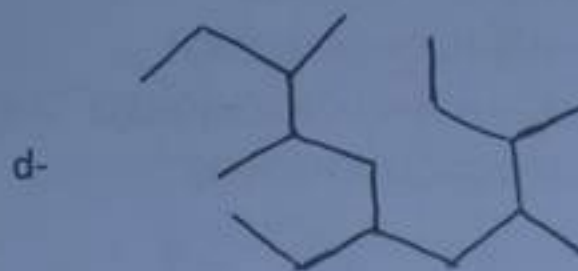
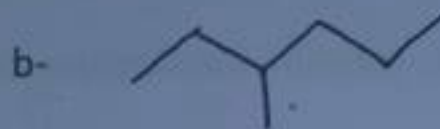


T.D n°1

I- Déterminez la chaîne principale et les ramifications des molécules ci-dessous et nommez-les.



II- Ecrivez une formule simplifiée contenant :

- a- Une chaîne principale de 7C avec deux ramifications de deux carbones chacune.
- b- Une chaîne principale de 8 carbones avec une ramification méthyle et une ramification isopropyle.
- c- Une chaîne principale de 6 carbones avec deux ramifications éthyles et une ramification tbu.

III- Dessinez en formule topologique (zig-zag) les structures associées aux noms suivants selon les règles de l'IUPAC :

- a- 4-isopropyl-3-méthylheptane.
- b- 3,7-diéthyl-5-isopropyldécane.
- c- 2,3,5-triméthylheptane

d- 4-éthyl-2-méthylhexane.

IV- Corrigez, s'il y a lieu, le nom des substances suivantes :

- a- 4-éthyl-2-méthylpentane.
- b- 5-éthyl-3-méthylheptane.
- c- 3-isobutyl-5-isopropylheptane.
- d- 5-[sec-butyl]-6-(tert-butyl)-3,5-diéthyl-7-isopropyl-2-méthylnonane.

V- Dessinez la formule topologique des molécules ci-dessous et donnez leur nom.

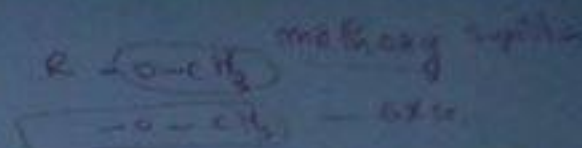
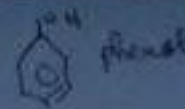
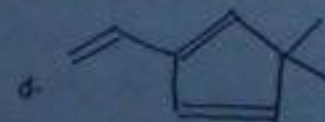
- a- $\text{CH}_3(\text{C}=\text{CH}_2)\text{CH}_2\text{CH}_3$
- b- $\text{CH}_3\text{CH}(\text{CH}_2\text{CH}_3)\text{CH}_2\text{C}\equiv\text{CH}$
- c- $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_2\text{CH}(\text{CH}_3)_2$
- d- $(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{CH}_3)_2$

VI- Dessinez les molécules ci-dessous :

- a- 3-éthyl-2-méthylhex-4-yne
- b- 3-nonyl-3-propylhexa-1,5-diène
- c- 1,3-dicyclopentylprop-2-ène
- d- 1,3,5-tripropylbenzène
- e- 6-méthylnona-2,4-diène
- f- 3-propylcyclohexène
- g- Cyclopenta-1,3-diène
- h- Cyclohexyne
- i- 3,3-diéthyl-4-méthyl-5-propylnon-7-én-1-yne.

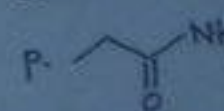
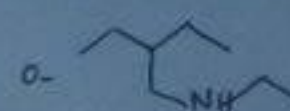
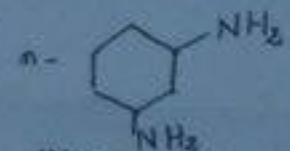
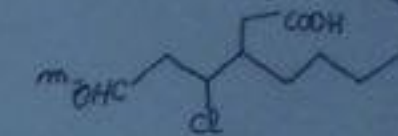
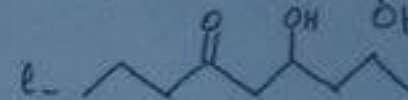
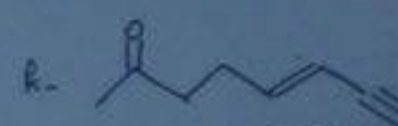
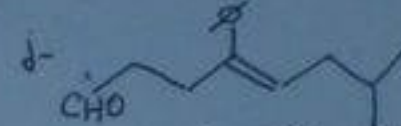
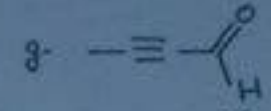
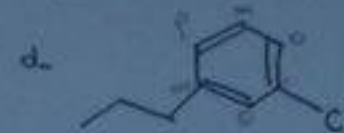
VII- Donnez les noms des produits suivants :

- a- $\text{CH}_3\text{CH}=\text{CH}-\text{C}\equiv\text{C}-\text{CH}_2\text{CH}_3$



VIII- Donner le nom selon l'IUPAC des molécules suivantes :

- a- $\text{Cl}-\text{CH}_2-\text{CH}_2-\text{OH}$
- b- $(\text{CH}_3)_2\text{CH}-\text{O}-\text{CH}_3$
- c- $\text{CH}_3-\text{O}-\text{CH}_2-\text{CH}_2-\text{CH}_3$

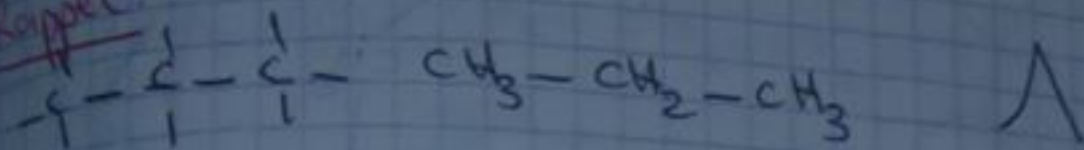


IX- Dessinez les structures correspondantes aux noms suivants :

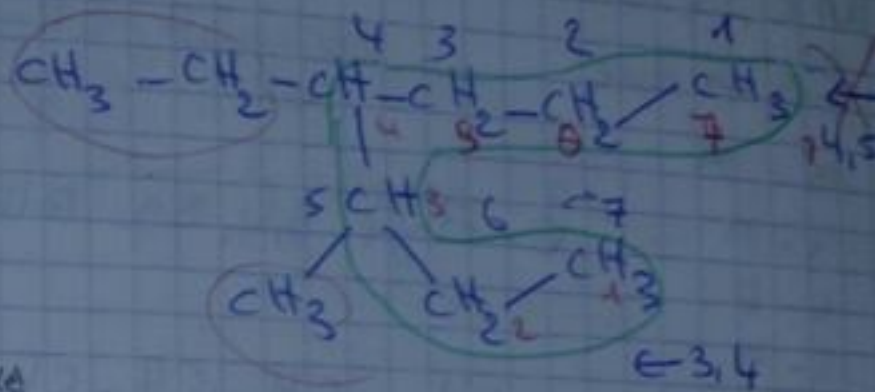
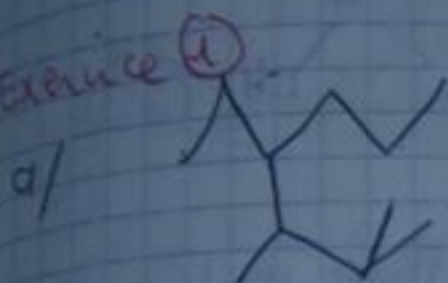
- a- 2-méthoxyoctane
- b- pentan-2-ol
- c- hept-3-yn-2-ol
- d- 3-éthoxy-4-éthylhexane
- e- 4-chloro-6-hexylhex-1-ène
- f- l'acide - 2,3-diméthylbutanoïque.
- g- l'acide - 3-aminobenzoïque.
- h- N-éthyl-N-méthylpropanamine.

Serie ①

Rappel:



Exercice ①



prefix | C.P. | suffix

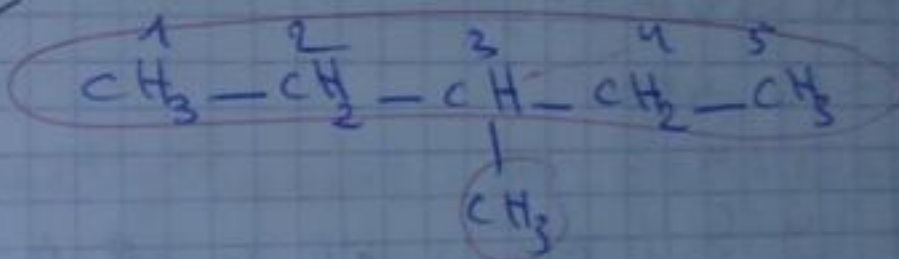
4-éthyle - 3-méthyle heptane

7C → hept

4-éthyle

(2,4) → ane

3-méthyle

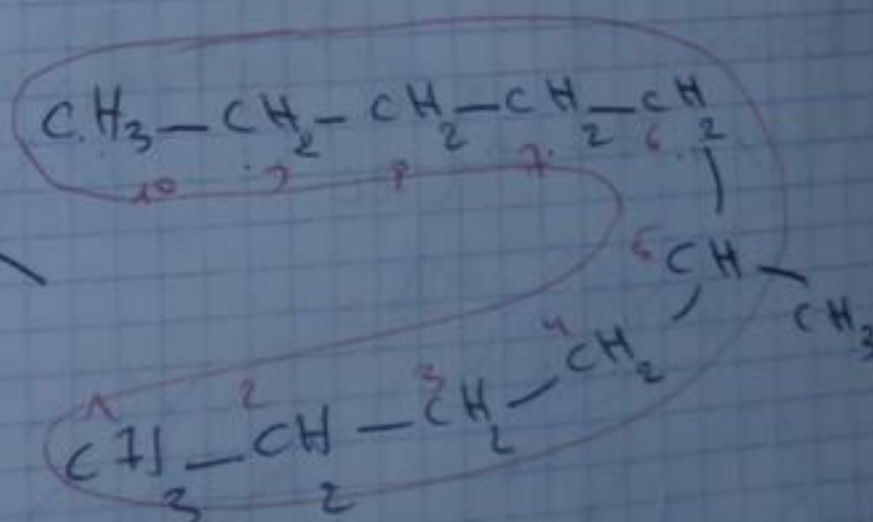
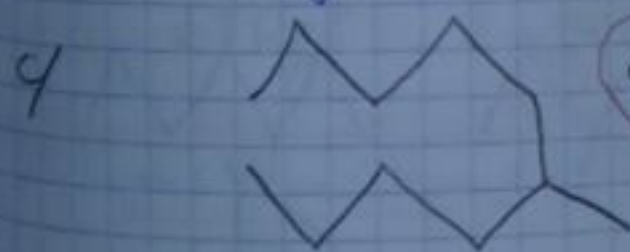


6C → hex

l.s → ane

3 → méthyle

3-méthylhexane



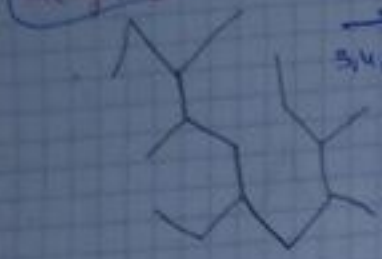
10C → dec

l.s → ane

5-méthyle

5-méthyldécane

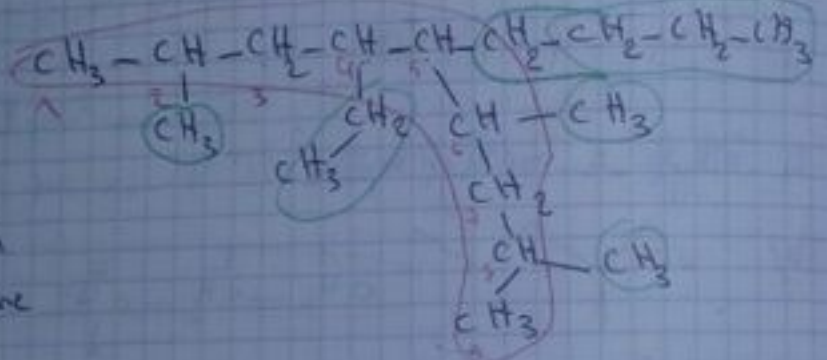
1-méthyl-5-éthyl-2



11C → undec
1,5 → anc

- 3 - M
- 4 - M
- 6 - E
- 8 - M
- 9 - M

6-éthyl-3,4,8,9-tetraméthyle undécane



2,4,6,8

9C → non
2,5 → anc

- 1 - E
- 4 - E
- 5 - but
- 8 - M
- 10 - M

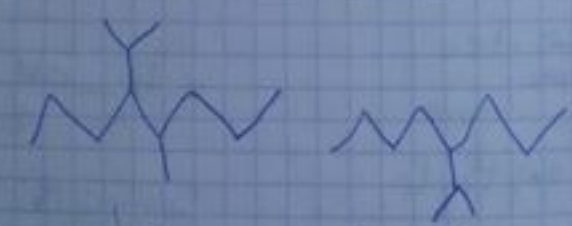
5-butyl-4-éthyle-2,6,8-triméthyle nonane

Exercice 10

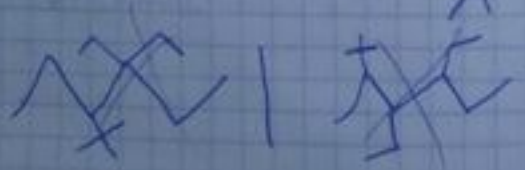
7C → { 2C
2C



8C { M
isop

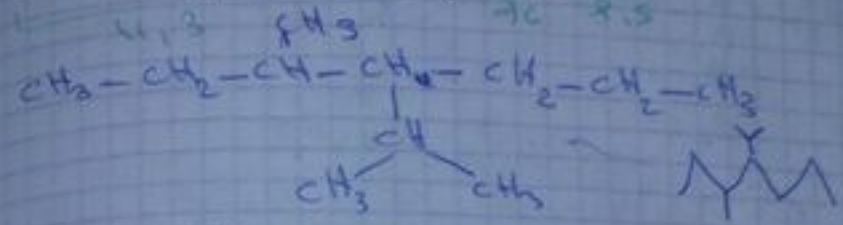


6C { E
E
tBu

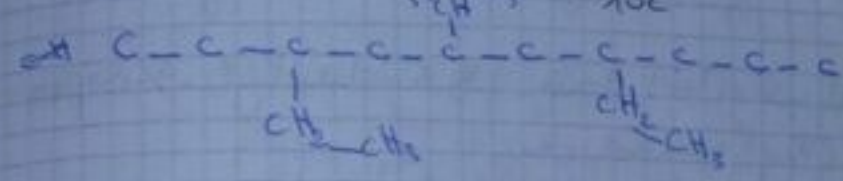


Exercice 11

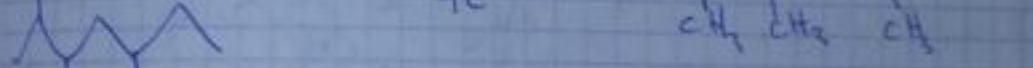
a- isopropyl-3-méthylheptane



b- 3,7-diéthyl-5-isopropyl décane



c- 2,3,5-triméthylheptane

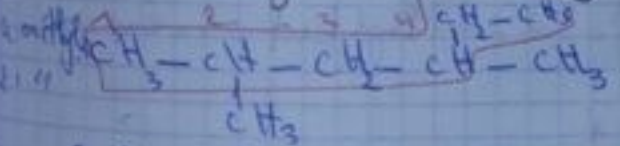


d- 4-éthyl-2-méthylhexane



Exercice 12

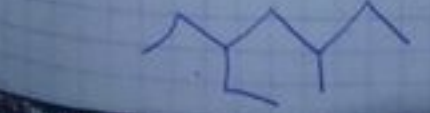
a- 4-éthyl-2-méthylpentane



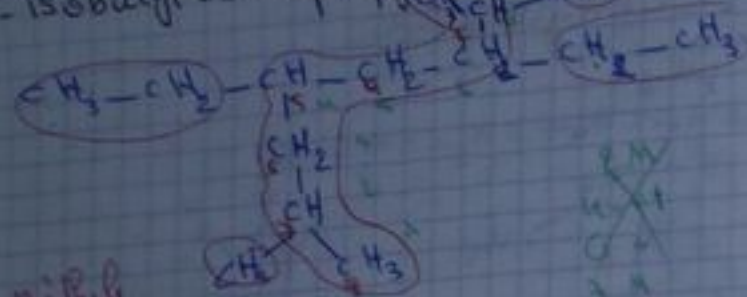
6C → hex
5C → anc
⇒ 2,4-triméthylhexane

b- 5-éthyl-3-méthylheptane

3-éthyl-5-méthylheptane



c/- isobutyl - 3-isopropyl heptane

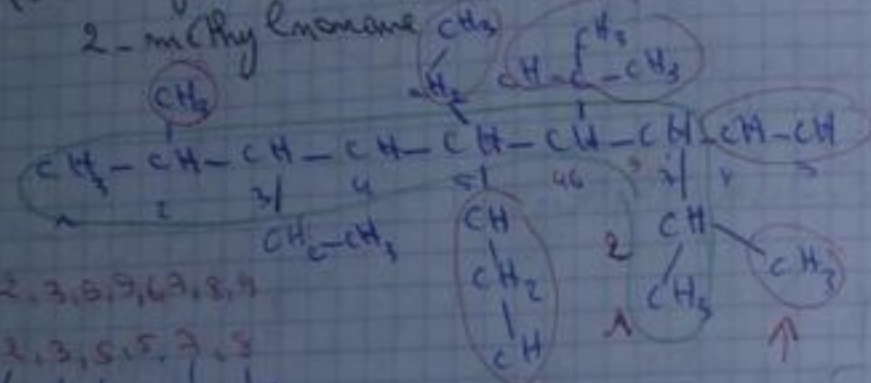


2-Methyl
3-ethyl
7-M
5-ethyl

3,5-diethyl - 2,7-dimethyl heptane

d/- (sec-butyl - 6-(tert-butyl) 3,5-dimethyl - 7-isopropyl

2-methyl nonane



2,3,5,6,7,8,9

2,3,5,6,7,8

M' 1 1 C 1 M

3,5,7,9-methyl - 2,8-dimethyl - 5-(sec-butyl)
6-(tert-butyl) nonane

Exercise V

a/ CC(C)CC=C 2-methylbut-1-ene

b/ CC(C)CC(C)C#C 4-methylhex-1-yne

c/ CC(C)CC(C)C#C 6-methylhept-3-yne

d. CC(C)CC(C)C 2,4-dimethylpentane

Exercise VI

a/ CC(C)CC(C)C#C 4-ethyl-5-methylhex-1-yne

b/ C=CC(C)CC(C)C#C

c/- C=CC(C)C#C 1,3-bis(cyclopentyl)prop-1-ene



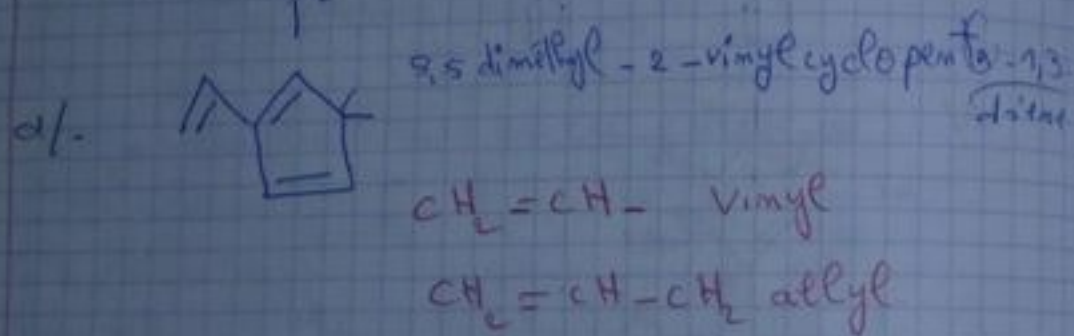
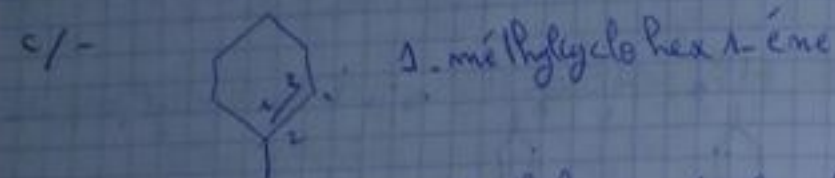
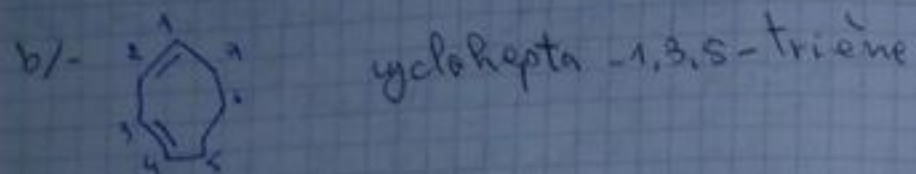
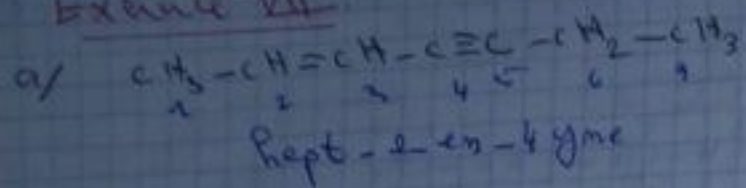
e/- CC(C)CC(C)C#C

f/- CC(C)CC(C)C#C 3-propylcyclohex-1-ene

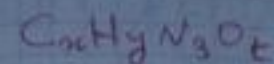
g/- CC(C)CC(C)C#C 5-methylcyclopent-1-ene

h/ CC(C)CC(C)C#C

Exercice VII:



Série n°2



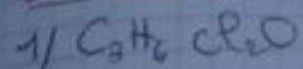
$$\text{DI} = x - \frac{1}{2}y + \frac{1}{2}z + 1$$

$x = \text{C}$

$y = \text{nbre H} + x = \text{halogène} = \text{Cl, Br, I, F}$

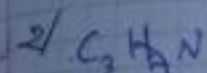
$z = \text{azote}$

Exercice I:



$$\text{DI} = 3 - \frac{1}{2}(6+2) + 1$$

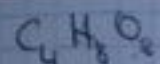
$= 0 \Rightarrow$ pas d'insaturation



$$\text{DI} = 3 - \frac{5}{2} + \frac{1}{2} + 1 = 1$$

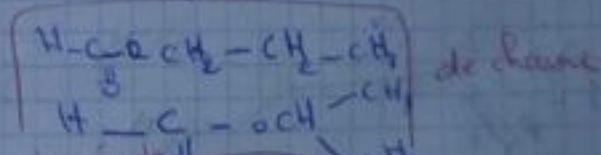
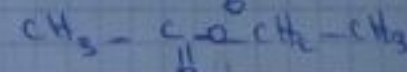
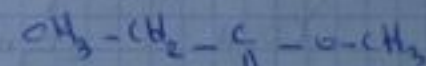
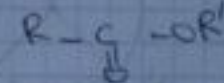
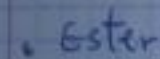
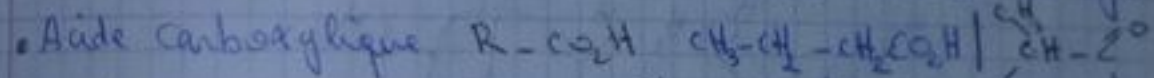
\Rightarrow ou 1 cycle

Exercice II:

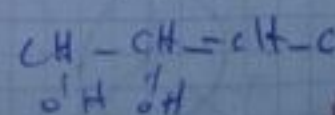
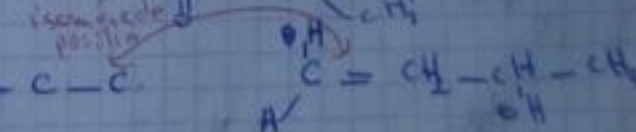
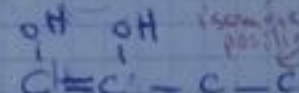
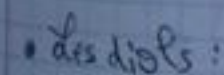


$$\text{DI} = 4 - \frac{8}{2} + 1 = 1 \Rightarrow 1 \text{ insaturation}$$

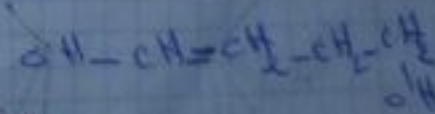
$\Rightarrow 1$ double ou cycle



de l'acide



position



Travaux Dirigés de Chimie Organique
Série n° 2

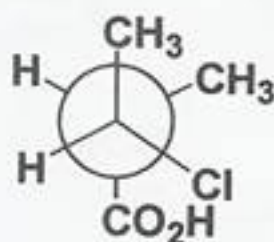
I) Donner le degré d'insaturation des composés suivants :

- 1) $C_3H_6Cl_2O$
- 2) C_3H_7N

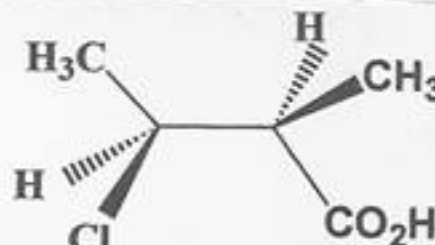
II) Déterminer les structures des isomères de formule brute : $C_4H_8O_2$.

Donner 2 isomères de position, 2 isomères de fonction ainsi que 2 isomères de chaîne.

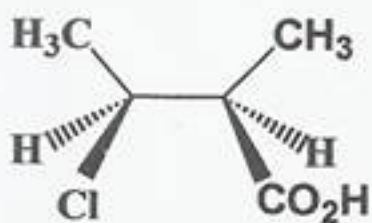
III) Préciser les relations stéréochimiques liant les représentations suivantes :



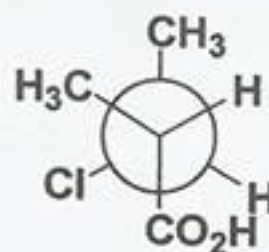
a)



b)



c)



d)

IV) Donner, en projective et en Newman, les différentes conformations du 1,2-dichloroéthane .

- Indiquer la conformation la plus stable ainsi que la moins stable .

V) Représenter, en perspective et en projection de Newman (selon la liaison : $C_2 - C_3$), la conformation la plus stable du : 3 - chlorobutan - 2 - ol .

VI) Donner, en perspective et en projection de Newman, le conformère le plus stable du :

- a) 3 - méthylcyclohexanol
 b) 1 - éthyl - 2 - méthylcyclohexane
 c) 1 - éthyl - 4 - tertibutylcyclohexane

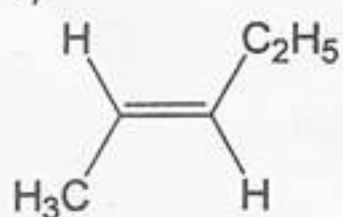
VII) Au sein de chacun des groupes suivants , classer les substituants par ordre de priorité décroissante, selon les règles de Cahn, Ingold et Prélog :

- a) - OH ; - CH₃ ; - F ; - CO₂H b) - CO(CH₃) ; - CO(NH₂) ; - C₆H₅ ; - Br
 c) - CH₂ - NH₂ ; - CN ; - CH₂ - Cl ; - C(CH₃)₃
 d) - NH₂ ; - CH₃ ; - CH₂ - OH ; - C₂H₅

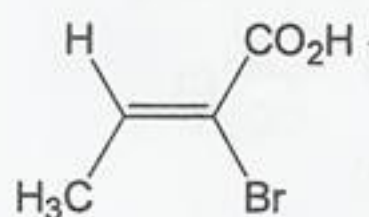
VIII) – En utilisant la nomenclature Z et E :

a) nommer les molécules suivantes:

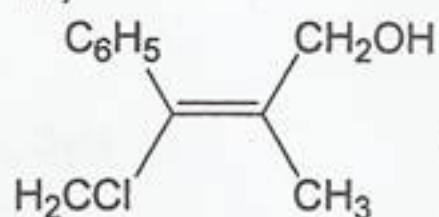
i)



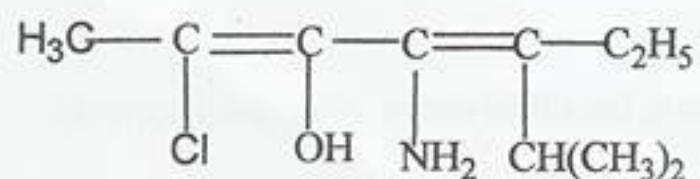
ii)



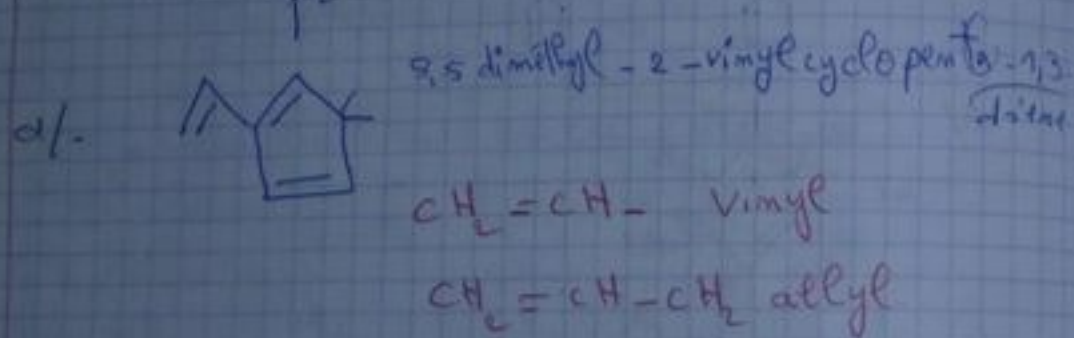
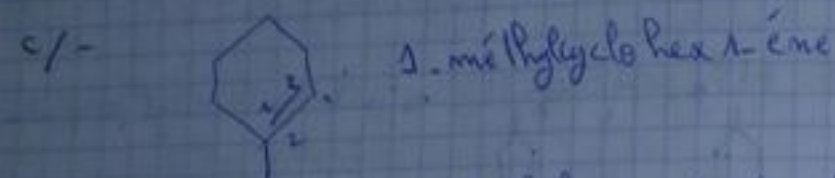
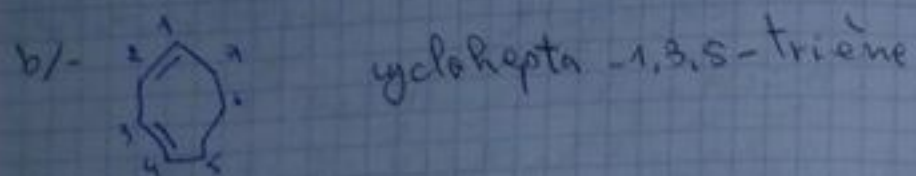
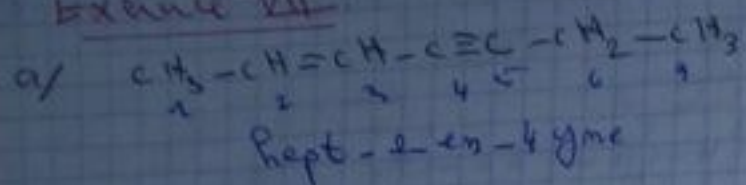
iii)



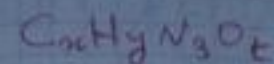
b) Donner tous les isomères du composé suivant :



Exercice VII:



Série n°2



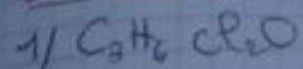
$$\text{DI} = x - \frac{1}{2}y + \frac{1}{2}z + 1$$

$x = \text{C}$

$y = \text{nbre H} + x = \text{halogène} = \text{Cl, Br, I, F}$

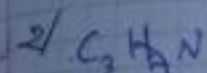
$z = \text{azote}$

Exercice I:



$$\text{DI} = 3 - \frac{1}{2}(6+2) + 1$$

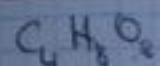
$= 0 \Rightarrow$ pas d'insaturation



$$\text{DI} = 3 - \frac{5}{2} + \frac{1}{2} + 1 = 1$$

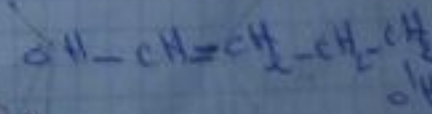
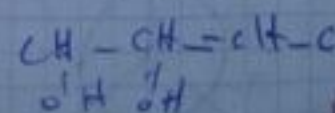
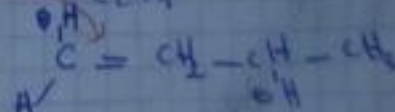
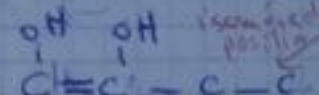
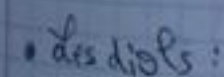
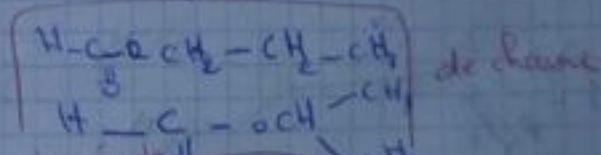
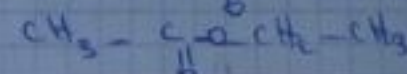
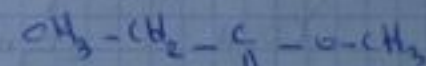
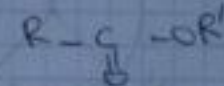
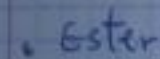
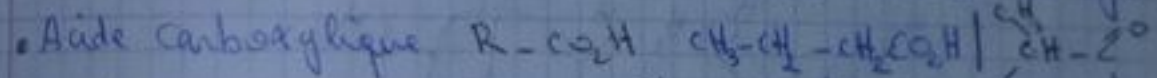
\Rightarrow ou 1 cycle

Exercice II:



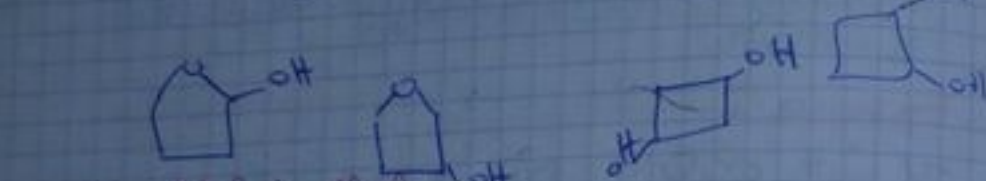
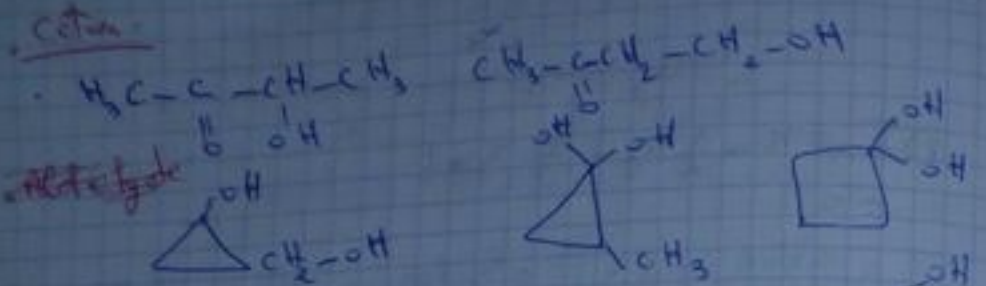
$$\text{DI} = 4 - \frac{8}{2} + 1 = 1 \Rightarrow 1 \text{ insaturation}$$

$\Rightarrow 1$ double ou cycle

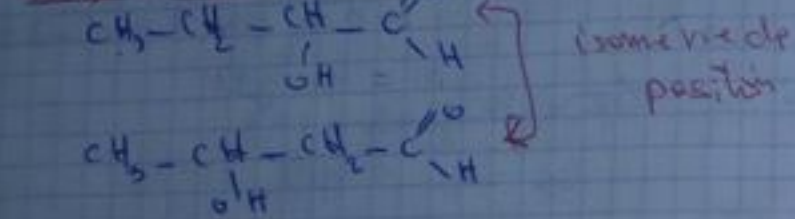


position

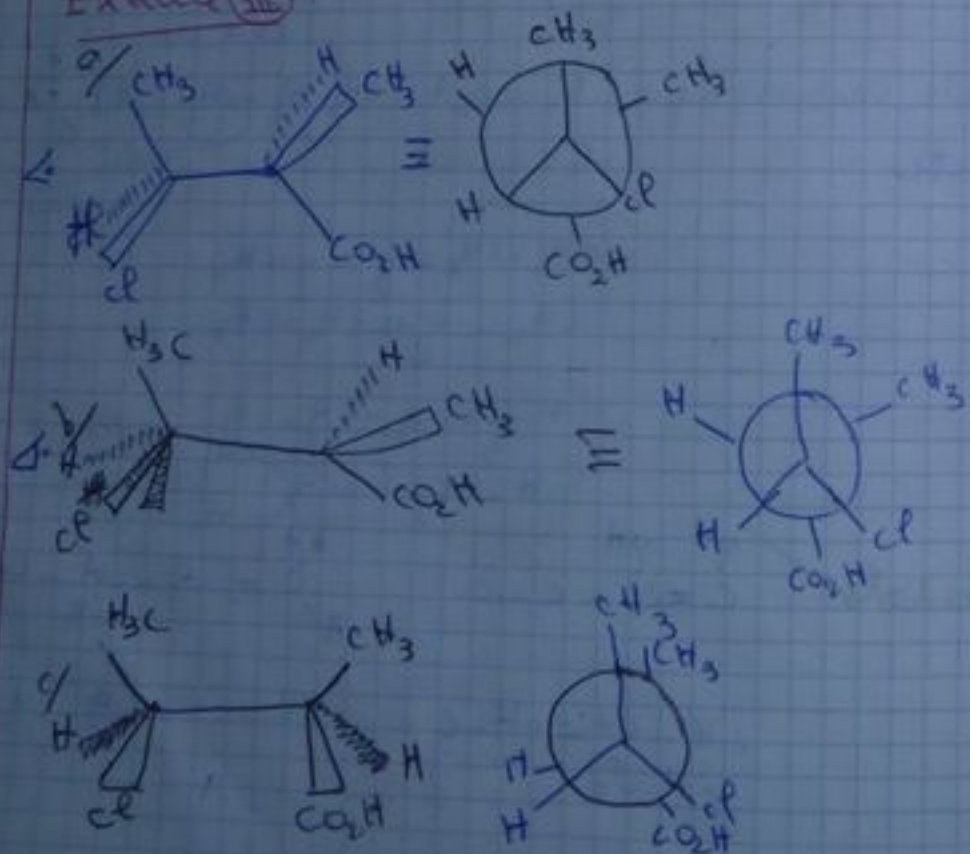
Catène



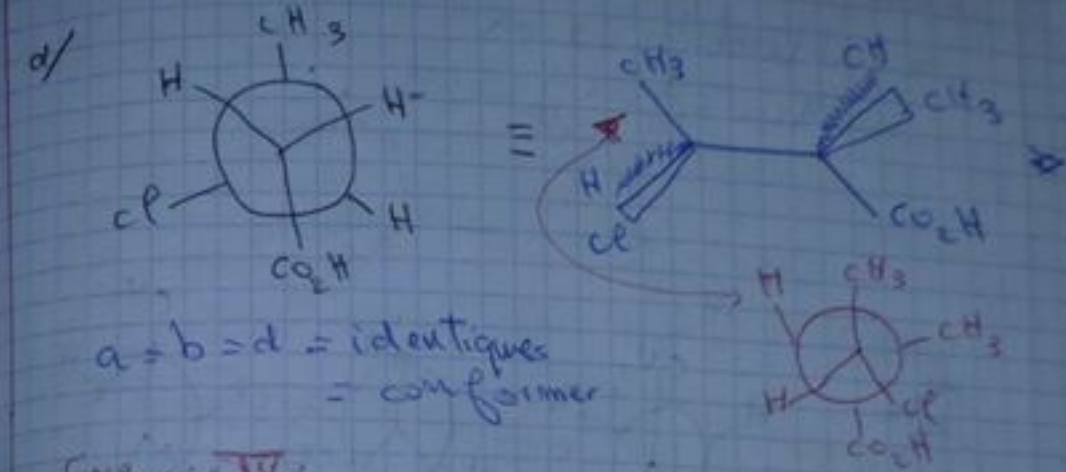
Alcote Lydte + Alcool



Exercice III

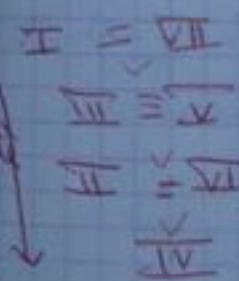
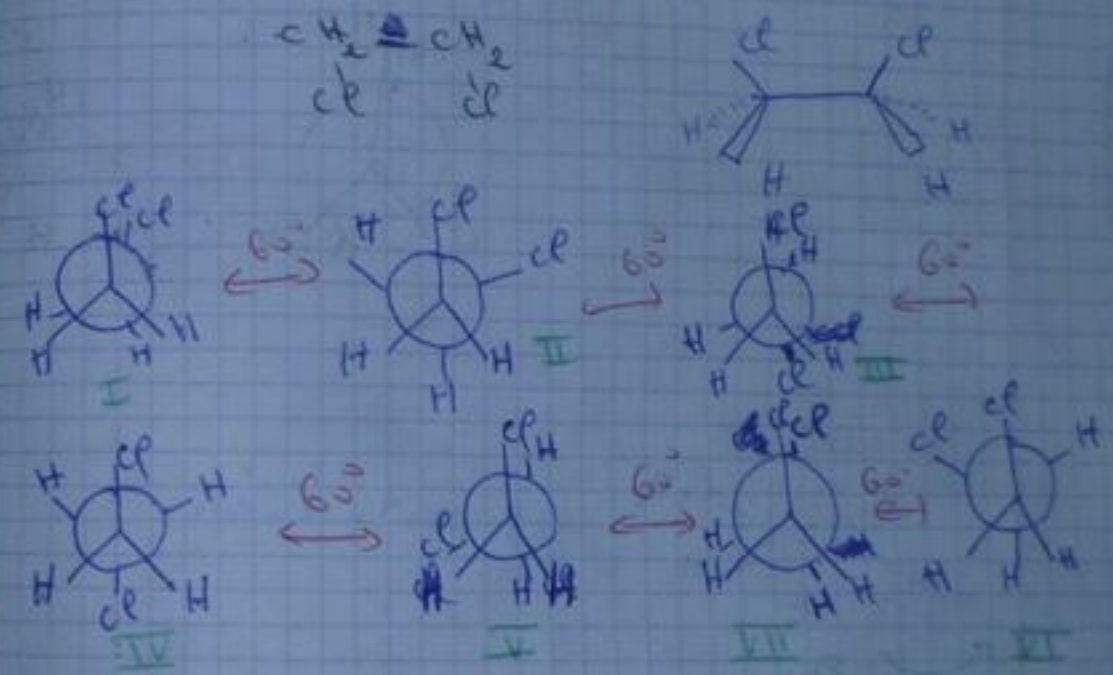
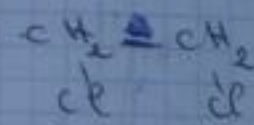


a=b Conformation avec \odot

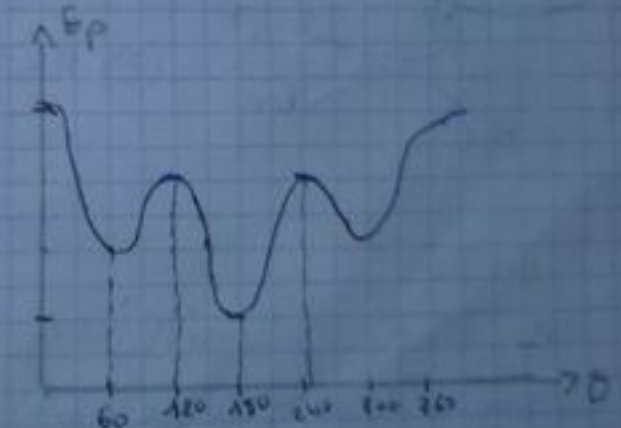
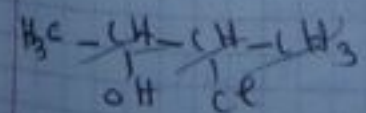


Exercice IV

1,2-dichloroéthane

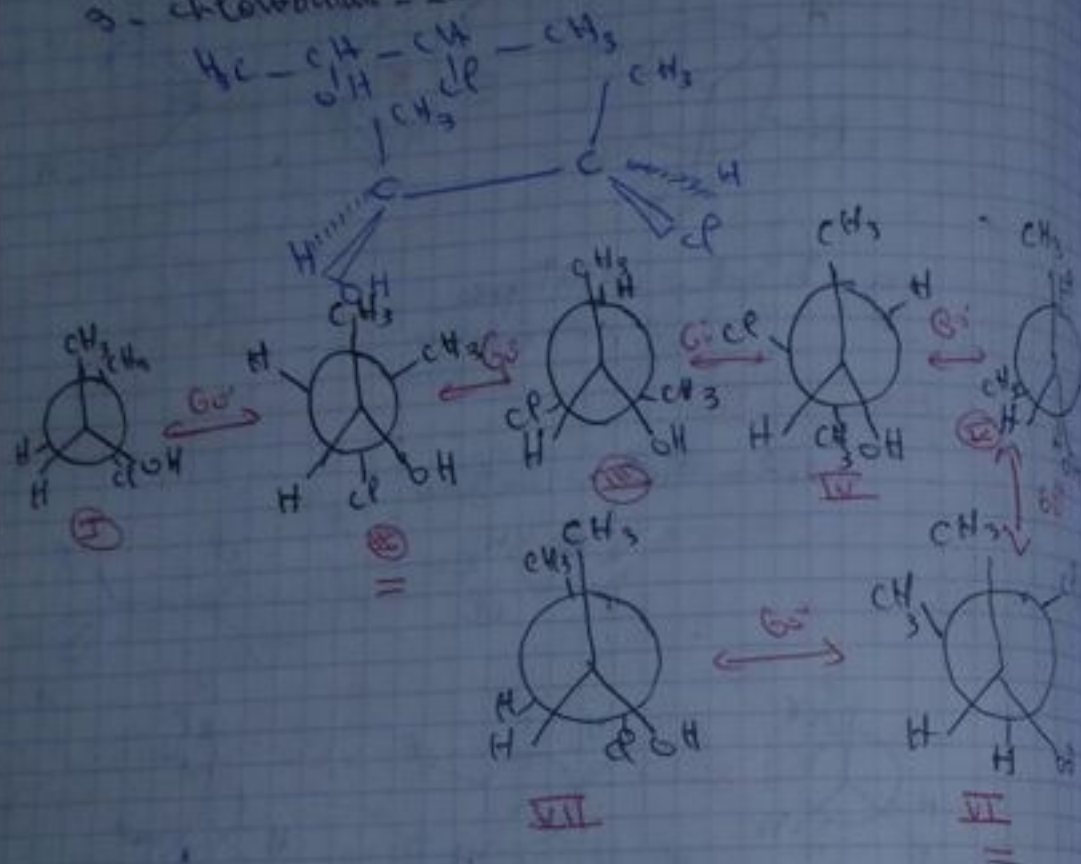


stabilité

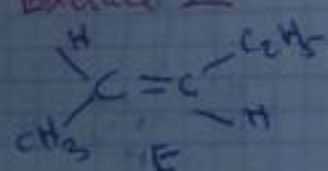


Exercice V

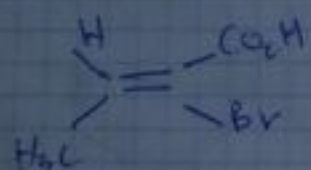
3-chlorobutan-2-ol



Exercice VII



(E) pent-2-ène



(E) Aride 2-bromobut-2-énique

Ex VIII

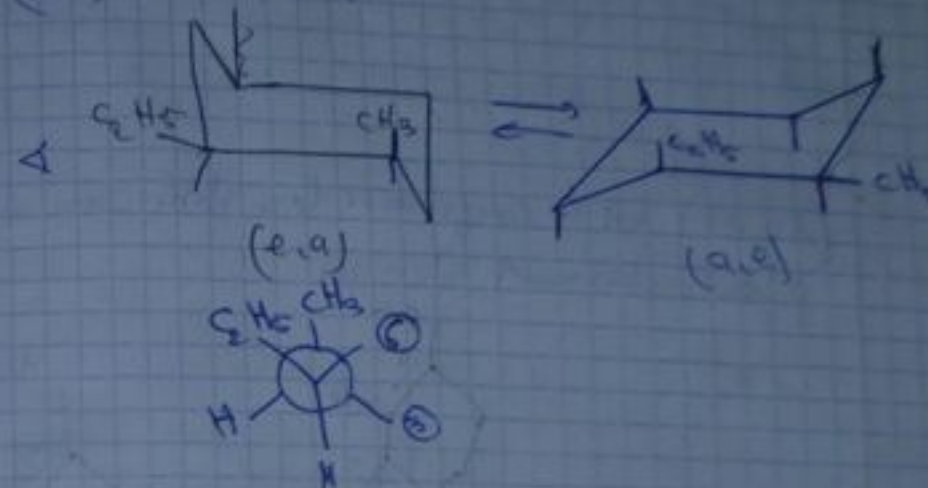
1-éthyl-2-méthylcyclohexane
compter le composé possible (cis ou trans)

Réponse:

on peut avoir deux composé possible le cis ou le trans

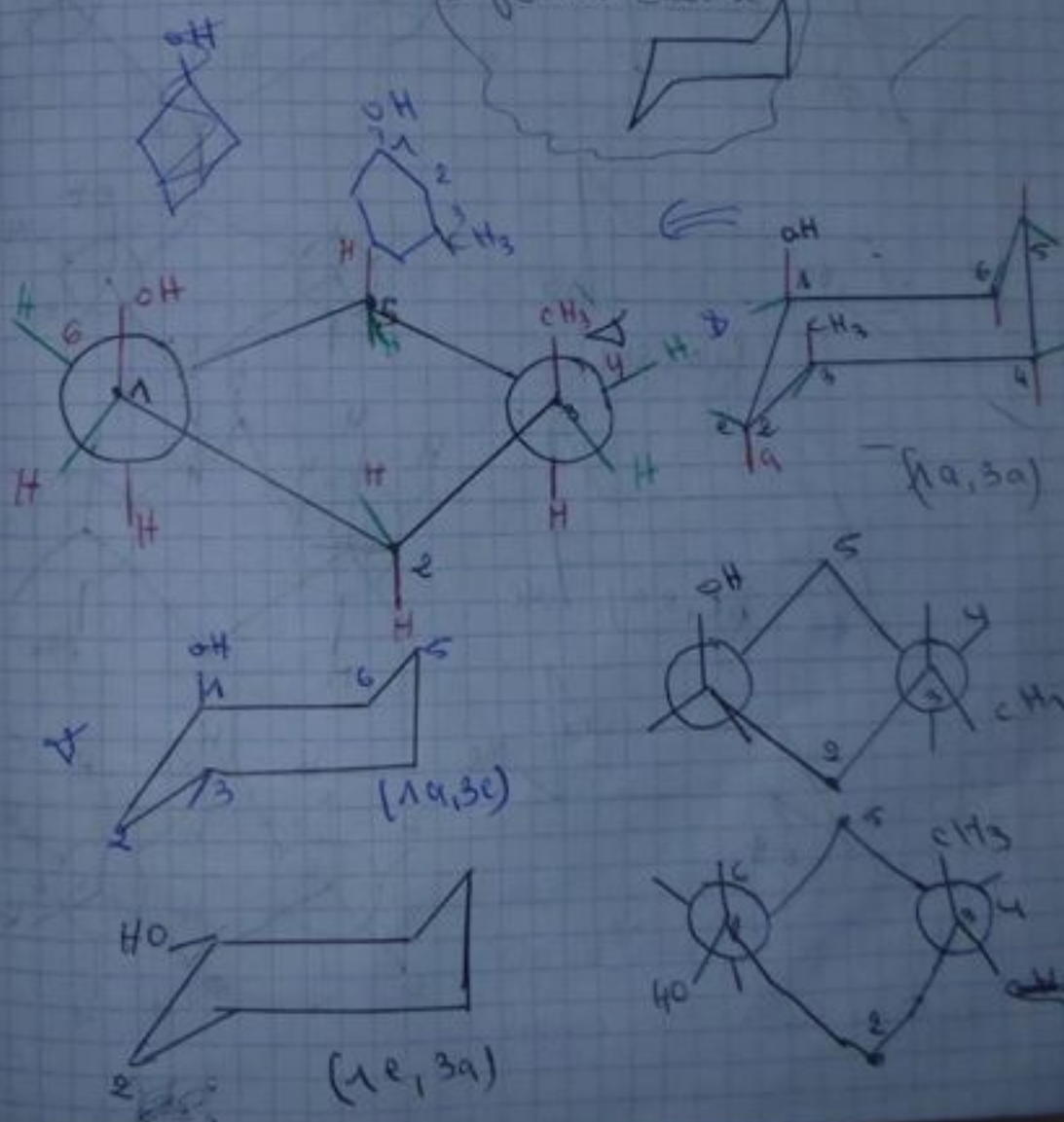
trans: axial ou (a,e) ou (e,a)
cis: (a,a) ou (e,e)

Cis

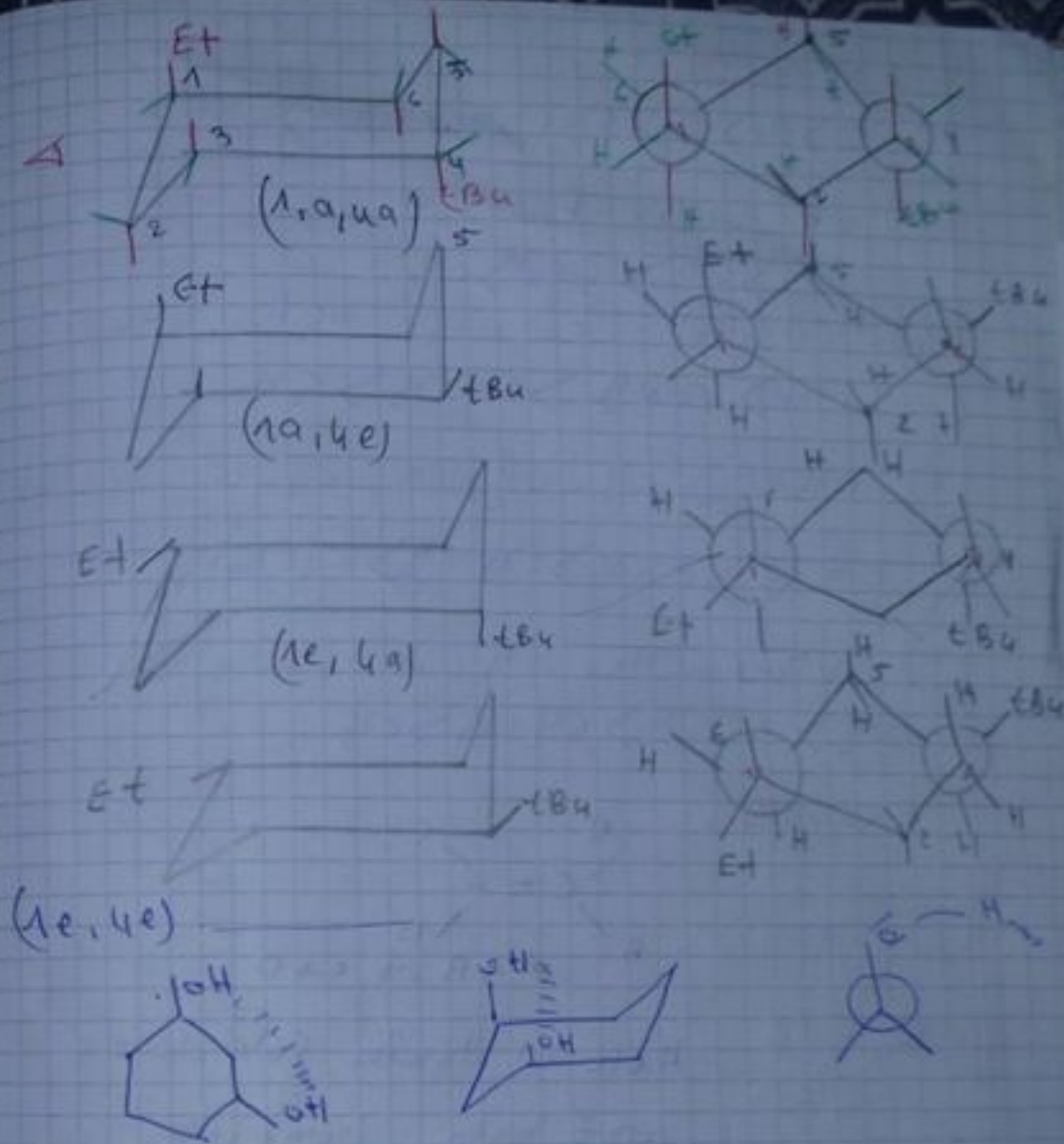
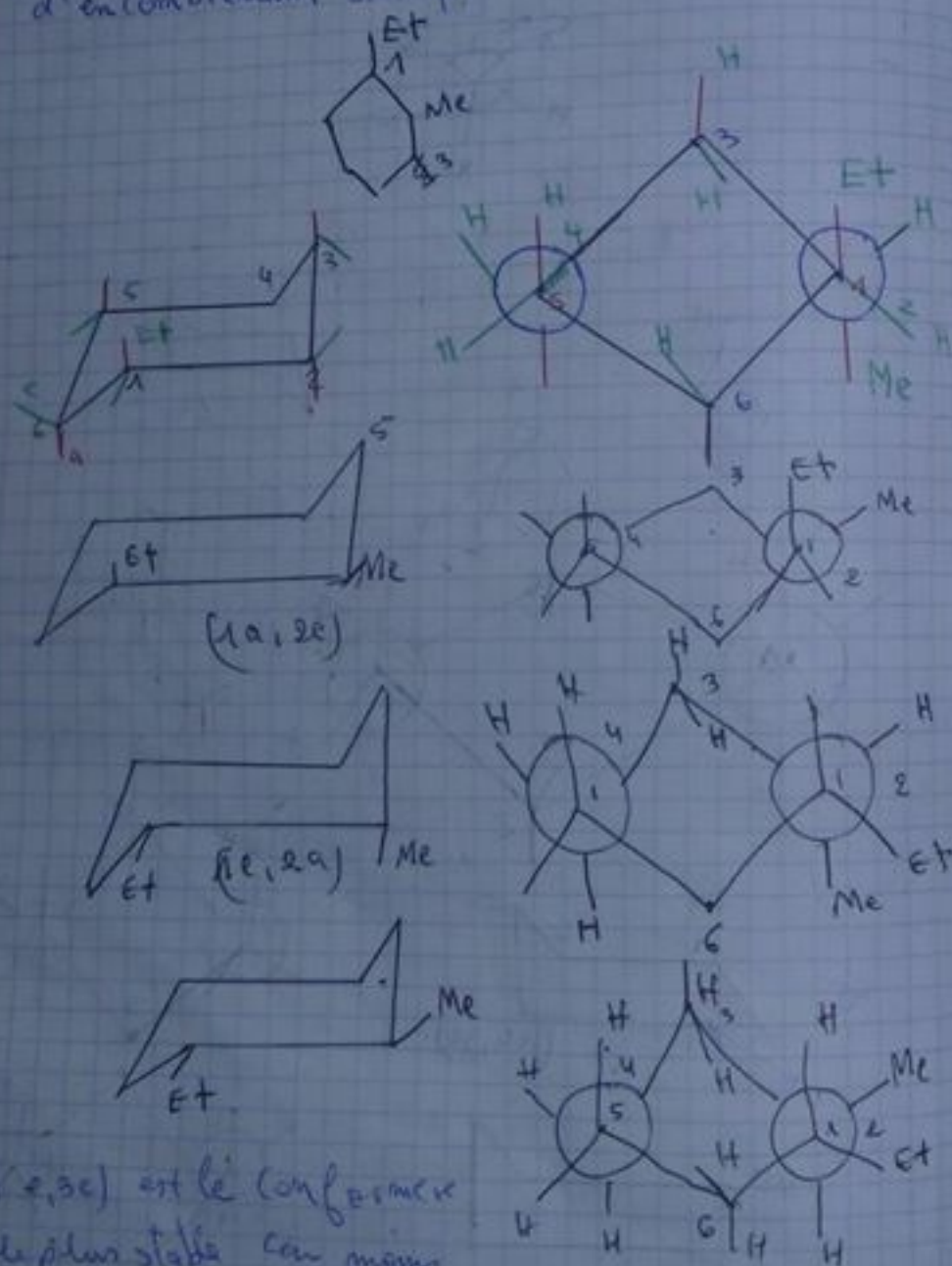


Exercice IX

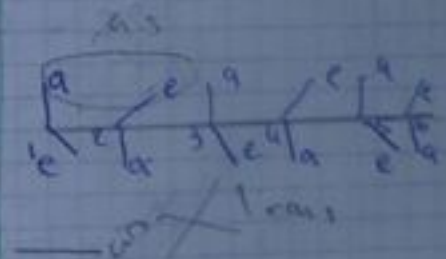
la forme chaise



(1a,2e) est le conformère le + stable car moins d'encombrement stérique



	Cis a,e e,a	Trans e,e, a,a
1,2	1a, 2e 2e, 1a	1a, 2a 1e, 2e
1,3	1a, 3a 1e, 3e	1a, 3e 1e, 3a
1,4	1a, 4e 1e, 4a	1a, 4a 1e, 4e



Exercice VII

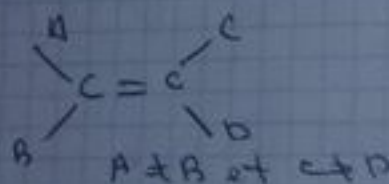
I) $\text{Br} > \text{CO}_2\text{H} > \text{S} > \text{P} > \text{F} > \text{O} > \text{N} > \text{C} > \text{H}$

a) OH: $-\text{CH}_3, -\text{F}, -\text{CO}_2\text{H}$
 $\text{F} > \text{OH} > \text{CO}_2\text{H} > \text{CH}_3$
 b) $\text{CO}(\text{CH}_3): -\text{CO}(\text{NH}_2), -\text{C}_6\text{H}_5, -\text{Br}$
 $\text{Br} > \text{CONH}_2 > \text{COCH}_3 > \text{C}_6\text{H}_5$

c) $-\text{CH}_2\text{Cl} > \text{CH}_2\text{NH}_2, -\text{CN}, -\text{CH}_2\text{Cl}, -\text{C}(\text{CH}_3)_3$
 $\text{CH}_2\text{Cl} > \text{C}\equiv\text{N} > \text{CH}_2\text{NH}_2 > \text{C}(\text{CH}_3)_3$

d) $\text{NH}_2, -\text{CH}_3, -\text{CH}_2, -\text{OH}, -\text{C}_2\text{H}_5$
 $\text{NH}_2 > \text{CH}_2\text{OH} > \text{CH}_2\text{CH}_3 > \text{CH}_3$

Exercice VIII



Si $\text{A} < \text{B}$ et $\text{C} < \text{D}$ A et C ont le même côté de =
 $\Rightarrow Z$ Sinon isomère E

